1: Clin Exp Immunol 1999 Jun;116(3):527-33 Related Articles, Books, LinkOut

Entrez PubMed

online

Rapid conversion of naive to effector T cell function counteracts diminished primary human newborn T cell responses.

Early E, Reen DJ.

Children's Research Centre, Our Lady's Hospital For Sick Children, Crumlin, Dublin, Ireland.

PubMed Services

The reduced incidence of graft versus host disease following the use of human cord blood as a source of stem cells for bone marrow reconstitution challenges our understanding of the immunocompetence of newborn T cells. Newborn CD4+ T cells express mainly the CD45RA phenotype and have been considered to respond comparably to adult CD4+ T cells exhibiting the CD45RA phenotype. We compared the in vitro kinetics of phenotypic conversion of newborn and adult CD4+CD45RA+ T cells to CD4+CD45RO+ T cells. The cytokine profile and B cell helper activity of the converted CD4+CD45RO+ T cell population were also determined. Newborn CD4+CD45RA+ T cells were converted to CD4+CD45RO+ with significantly faster time kinetics than adult CD4+CD45RA+ T cells, following either phytohaemagglutinin (PHA) or anti-CD2 activation. Freshly purified newborn naive T cells did not produce IL-2, IL-4 or interferon-gamma (IFN-gamma) following stimulation, whereas adult naive T cells secreted IL-2 and adult-derived CD4+CD45RO+ T cells secreted all three cytokines under the same stimulatory conditions. However, newborn and adult CD4+CD45RA+ T cells, following primary stimulation and maturation in vitro, acquired the ability to secrete a Th1-type cytokine profile of IL-2 and IFN-gamma after secondary stimulation. Newborn CD4+ naive T cells that acquired the CD45RO phenotype in vitro also gained B cell helper activity equivalent to that of adult in vitro matured CD4+ naive T cells. These findings suggest that newborn and adult CD4+CD45RA+ T cell subsets are differentially responsive to various stimuli. They show that newborn CD4+CD45RA+ naive T cells can transform more quickly than their adult counterparts into functionally equivalent CD4+CD45RO+ T cells, a process that may be important to counteract the immature immune environment which exists in the newborn.

PMID: 10361246 [PubMed - indexed for MEDLINE]

Related Resources

1: Clin Exp Immunol 1999 Jun;116(3):527-33 Related Articles, Books, LinkOut

Entrez PubMed

online

Rapid conversion of naive to effector T cell function counteracts diminished primary human newborn T cell responses.

Early E, Reen DJ.

Children's Research Centre, Our Lady's Hospital For Sick Children, Crumlin, Dublin, Ireland.

PubMed Services

The reduced incidence of graft versus host disease following the use of human cord blood as a source of stem cells for bone marrow reconstitution challenges our understanding of the immunocompetence of newborn T cells. Newborn CD4+ T cells express mainly the CD45RA phenotype and have been considered to respond comparably to adult CD4+ T cells exhibiting the CD45RA phenotype. We compared the in vitro kinetics of phenotypic conversion of newborn and adult CD4+CD45RA+ T cells to CD4+CD45RO+ T cells. The cytokine profile and B cell helper activity of the converted CD4+CD45RO+ T cell population were also determined. Newborn CD4+CD45RA+ T cells were converted to CD4+CD45RO+ with significantly faster time kinetics than adult CD4+CD45RA+ T cells, following either phytohaemagglutinin (PHA) or anti-CD2 activation. Freshly purified newborn naive T cells did not produce IL-2, IL-4 or interferon-gamma (IFN-gamma) following stimulation, whereas adult naive T cells secreted IL-2 and adult-derived CD4+CD45RO+ T cells secreted all three cytokines under the same stimulatory conditions. However, newborn and adult CD4+CD45RA+ T cells, following primary stimulation and maturation in vitro, acquired the ability to secrete a Th1-type cytokine profile of IL-2 and IFN-gamma after secondary stimulation. Newborn CD4+ naive T cells that acquired the CD45RO phenotype in vitro also gained B cell helper activity equivalent to that of adult in vitro matured CD4+ naive T cells. These findings suggest that newborn and adult CD4+CD45RA+ T cell subsets are differentially responsive to various stimuli. They show that newborn CD4+CD45RA+ naive T cells can transform more quickly than their adult counterparts into functionally equivalent CD4+CD45RO+ T cells, a process that may be important to counteract the immature immune environment which exists in the newborn.

PMID: 10361246 [PubMed - indexed for MEDLINE]

Related Resources